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As to the earlier uses of the word given in Murray's 'New English Dictionary,' which, in Dr. Eastman's opinion, furnish a further proof of my want of accuracy, I regard them as proving quite the contrary, as is shown in the following brief analysis of the references under geology.

Richard de Bury's use of the word is defined as 'applied to the study of the law as distinguished from the arts and sciences, which are concerned with the works of God.'

'Geologia' is also the title of an Italian work by F. Sessa, which is intended to prove that the influences ascribed by astrologers to the stars really proceeded from the earth itself. As Murray evidently recognizes, neither of these usages has any relation to modern geology.

He subdivides the later usages of the word geology as (1) 'The science which treats of the earth in general.'

Of those referred to as having used it in this sense, Erasmus Warren (1690) was a Suffolk rector, defending the literal correctness of the Mosaic account of the deluge; B. Martin (1735), a learned optician, who classified rather elaborately the science of his day; and Nathan Bailey (1736) and Dr. Samuel Johnson (1755), lexicographers, who defined it as 'the doctrine of the earth.'

None of these, it is evident, could be considered to be geologists.

It is only Murray's second division—namely, 'the science which has for its object the investigation of the earth's crust, etc.,' which corresponds to the modern acceptation of the word considered in my address, and under this head his first reference is to J. Hutton (1795), who published sixteen years after De Saussure.

Hence, in spite of Dr. Eastman's specious representation of the facts, only a moment's consideration of which he thinks necessary to prove my historical inaccuracy, I still maintain the correctness of my statement, in which I have followed so excellent an authority as Sir Archibald Geikie, who says, in his chapter on De Saussure ('Founders of Geology,' page 88), 'the earliest writer who dignified it [geol-

ogy] with the name it now bears, was the first great explorer of the Alps.'

S. F. EMMONS.

WASHINGTON,  
November 28, 1904.

#### THE KELEP AND THE COTTON PLANT.

TO THE EDITOR OF SCIENCE: Professor Wheeler's criticism of Dr. Cook's theory regarding the association of the kelep or Gaute-malan ant, with the cotton for its nectar (SCIENCE, December 2, page 768) is quite timely. Dr. Cook's theory and the facts upon which it is founded are decidedly unique. In bulletin 49, Division of Entomology, U. S. Dept. of Agriculture, page 64, Professor Cook states that in Texas 'More ants will be necessary, however, for their protection, and the nectar-producing qualities of the different varieties may become a question of practical importance if the kelep should become established.' "At present the nectar secreted on the leaves and squares of the cotton goes to waste, or even serves to attract injurious insects, among them the boll worm moths."

"The discovery of the ant supplies a practical reason for the existence of the nectaries hitherto quite unsuspected, and it suggests the further possibility that the weevil and the ant may have been factors in the evolution of the cotton plant, for the weevil is not known to feed on any plant except cotton." Was the kelep then first attracted to the cotton on account of the nectar or by its appetite for the weevil? That the nectar of the cotton otherwise goes to waste is a surprising statement, inasmuch as a very large proportion of the honey stored by honey bees throughout the southern states is secured from cotton, as is well known to all practical bee keepers. Furthermore, the writer was under the impression that American cotton was originally of oriental origin. If so, how could the kelep and boll weevil have been a factor in the evolution of the cotton plant in the orient where they are not known to occur?

It would seem to the writer that considerably more evidence is necessary to establish such a theory, and that a more intimate knowledge of the cotton plant and the insects

associated with it is highly desirable before it can be stated that nectar at present 'goes to waste.'

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DURHAM, N. H.,  
December 6, 1904.

#### ANENT GIZZARDS.

PROFESSOR EASTMAN\* expresses his willingness 'to consign to birds the exclusive enjoyment of gizzards and feathers'; but this seems hardly fair to certain fishes. According to Günther† in the well-known gray mullets (*Mugil*) "the second portion of the stomach reminds one of the stomach of birds; it \* \* \* is globular, and surrounded by an exceedingly strong muscle. This muscle is not divided into two as in birds, but [is] of great thickness in the whole circumference of the stomach, all the muscular fasciculi being circularly arranged. The internal cavity of this stomach is rather small, and coated with a tough epithelium \* \* \*. A low circular valve forms a pylorus." Certainly one can not carp at Drs. Jordan and Evermann‡ for referring to this apparatus as 'gizzard-like,' with which adjective Mr. Barnum Brown contented himself when writing of the plesiosaurs.

The food of the mullets is said§ to consist 'chiefly of the organic substances mixed with mud or sand,' of which they 'take in a quantity.' However, it must also be set down that 'in order to prevent larger bodies from passing into the stomach \* \* \* these fishes have the organs of the pharynx modified into a filtering apparatus' so that 'stomach stones' if present, can never be large. At all events (to state the obvious conclusion) if two such widely separated vertebrates as *Gallus* and *Mugil* have independently evolved gizzard-like modifications of the stomach, why should a similar possibility be denied *a priori* to all reptiles? But whether plesiosaurs were

'lithophagi' or lotus eaters Herodotus saith not.

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#### NOTE ON THREE VERY LARGE BEAKED WHALES FROM THE NORTH PACIFIC.

TO THE EDITOR OF SCIENCE: Early in November last, I received a letter from President D. S. Jordan, of the Leland Stanford, Jr., University, enclosing a communication from Mr. J. H. Ring, of Ferndale, Humboldt County, California, relative to the stranding of a whale about forty-one feet long near that place. Mr. Ring's letter was accompanied by photographs which made it evident that the animal was one of the ziphioid or beaked whales, of extraordinary size and not in a very good state of preservation. I have recently received additional information from Mr. Ring which makes it certain that the whale belongs to the genus *Berardius*. This genus was first recognized as belonging to the fauna of the North Pacific by Dr. Stejneger, who found a skull on Bering Island in 1882, and, believing it to represent a new species, gave it the name of *Berardius bairdii*. Whether the Ferndale specimen is of that species can not be determined until the skull has been examined.

The specimen is notable as being, so far as I am aware, the first of the genus reported from the Pacific coast of the United States, and further as being the largest beaked whale of which there is any record. In Mr. Ring's second letter, he informed me that he had re-measured the whale and found it to be 43½ feet long. The largest *Berardius* previously known was the type of *B. arnuxii* of New Zealand, which was 32 feet long.

Two large beaked whales were found on the coast of St. George Island, Pribilof Group, Alaska, in June, 1903, by Mr. James Judge, the resident treasury agent. One of these, a female, was reported by Mr. Judge as being 40 feet 2 inches long, and hence only a little smaller than the Ferndale whale. The other specimen, a male, was 25 feet 5 inches long. It is not certain that these Pribilof whales are of the genus *Berardius*, though the in-

\* SCIENCE, N. S., Vol. XX., October 7, 1904, p. 466.

† 'An Introduction to the Study of Fishes,' p. 503.

‡ 'The Fishes of North and Middle America,' Part I., p. 809.

§ Günther, *op. cit.*, p. 502.